Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of:	)	
NextNav, Inc.	)	**WT Docket No. 24-240**
Petition for Rulemaking	)	**RM-11989**

Comments of Southern California Edison

Southern California Edison ("SCE") hereby files these Comments in response to the Public Notice, DA 24-776, released August 6, 2024, in the above-captioned proceeding. In these Comments, SCE documents its extensive use of the 900 MHz ISM Band ("Lower 900 MHz Band") for critical operations throughout its Southern California service area. In light of the disruption to these operations that would occur if the Commission were to revise its rules consistent with the proposals in the Petition for Rulemaking ("Petition") of NextNav Inc., SCE urges the Commission to reject that Petition.

SCE urges the Commission to reject any changes in the existing rules that negatively impact wireless communications operation in the Lower 900 MHz Band, specifically rules that would a) add new restrictions to present and future use of the full existing allocated spectrum of 902-928 MHz by SCE and other incumbents, b) elevate the standing of any entity using the Band to have priority of usage, such as immunity from causing interference and protection from receiving interference, over that of SCE and incumbent users, c) modify or create new licensed uses/users in the band operating under nationwide, system or similar licensing where the specific location of each transmitter is not documented and available publicly prior to commencement of operation and d) allow such a licensed service to lease or sell excess capacity to other entities where such action was not part of any original FCC authorization.

I. About Southern California Edison

SCE is a major electric utility in Southern California. SCE serves approximately 15 million people in a 50,000-square-mile service area within Central, Coastal and Southern California, including more than 180 incorporated cities and 15 counties.[1] SCE maintains approximately 125,000 miles of distribution and bulk transmission lines, with 1.3 million distribution structures, 1.4 million electric poles and 142,000 transmission structures.

II. SCE's Extensive and Long-Standing Use of the Lower 900 MHz Band

SCE has continuously occupied the Lower 900 MHz Band since rules for its use were first established. In 1985, the FCC first created rules allowing the use of Digital Spread Spectrum Communications in the Lower 900 MHz

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[1] *See About Us,* Southern California Edison, https://www.sce.com/about-us (last viewed Aug. 27, 2024).

Band. SCE sought vendors who were manufacturing products to exploit this new technology. A vendor, Metricom, was selected to supply radio equipment and a network was deployed.

Just under 40 years later, that initial network has expanded into 65,000 radios deployed from Central California to the Arizona and Nevada borders. Since that time SCE has constructed other networks including a similarly widespread system of remotely read smart-meters that currently link 5,000,000 homes with smart grid technology. Presently SCE also has 900 MHz ISM devices operating in and around its infrastructure including transmission lines, substations, corporate campuses, regional offices, service centers and generation facilities providing security and data linking of fixed and moveable equipment.

During the intervening 40 years, SCE has upgraded the technology deployed to the best technology solution available at that time. SCE is in fact in the middle of a new deployment of current technology in the Lower 900 MHz Band to carry it through at least the next decade.

It is quite possible that SCE is the largest user of the Band within its Southern California service and generation territories. Figure 1 below shows the density of radios that has grown out of the original Metricom technology.

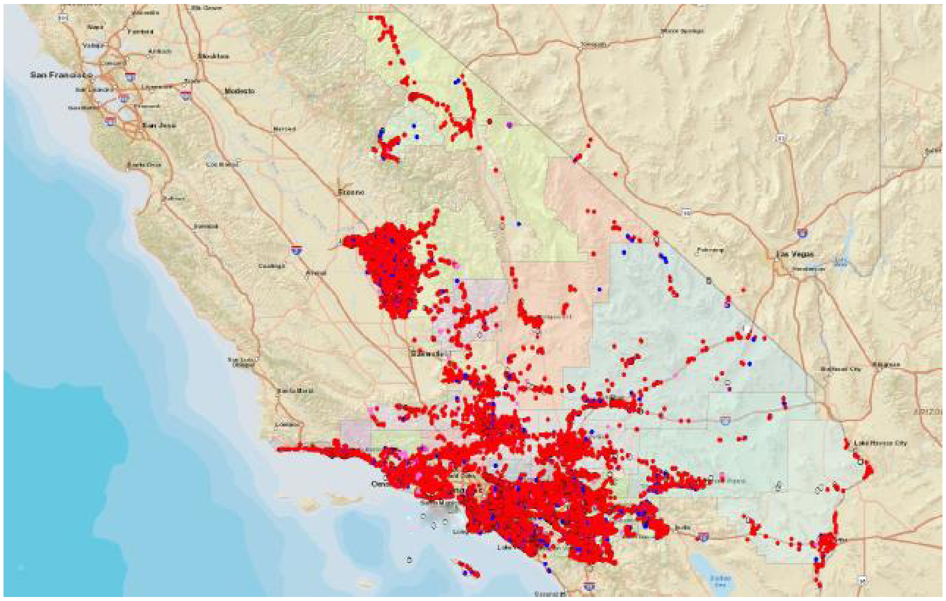

***Figure 1:* Extent of the present-day SCE NetComm Network**

The need and variety of telecommunications used in a utility the size of SCE is staggering. SCE presently has the following types of communications networks deployed to support its various needs: Point to point microwave in the 6 and 18 GHz bands, Optical Fiber Networks, Space Satellite Networks, VHF point to multipoint, 900 MHz SMR, Cellular Telephone and of course WiFi networks. However, none of these technologies can be used to practically replace either its Lower 900 MHz Band NetComm or AMR SmartGrid networks.

As mentioned above SCE is engaged in two primary uses of the Lower 900 MHz Band. The first of these is referred to as NetComm. NetComm is a digital MESH wireless network based upon geographic routing. Its primary purpose is to provide transport of critical SCADA (Supervisory Control and Data Acquisition) data to allow SCE to operate its grid infrastructure safely, reliably, and economically, as well as to provide wireless meter reading for commercial and industrial clients. It is in continuous operation 24/7/365. This network uses the full 902-928 MHz spectrum to transfer packetized data between head ends and remote endpoints. As indicated above, there are approximately 65,000 radios deployed throughout the service and generation territory supported by approximately 110 head ends.

Each head end consists of multiple radios, RF window filtering and an antenna system. Window filtering is required because the 902-928 band is closely bordered on the lower frequency side by 800 MHz cellular phone base stations, and above by the high ERP 900 MHz Paging Band. The use of window filtering also protects adjacent band users from potential out of band energy generated in the SCE NetComm Radios.

NetComm radios are distributed widely throughout SCE's service and generation territory. They are unique in that they do not require a physical network connection to transfer their data back to a centralized point. Such a wired network would be prohibitively expensive to deploy. The use of MESH network technology is the only answer to constructing such a network and is a perfect fit with its various uses.

Quality of service in the NetComm radio system is partially measured by packet transit time. Packet transit times are documentable and are used to indicate potential trouble with the network. Delaying of packets reduces network throughput which in turn makes the SCADA data less reliable, sometimes to the point where the data is so delayed it can no longer be relied upon.

Historically, SCE has found that when a new user of the 902-928 MHz band commences operations, the transit time for SCE packets across neighboring radios increases. SCE has to mitigate each case individually by deploying additional routers, repositioning antennas or by working directly with the interfering signal's equipment owner to relocate their equipment. Currently, there is dense use of this band in many portions of the SCE service area.

Figure 2 below is a spectrum capture of the typical 902-928 band usage in a combined industrial and residential area. This graphic was created in Ontario, California, just south of the Ontario International Airport. It is an approximately 5 minute integration of the various signals from all users in the band. This area is within the SCE service territory. SCE believes that it is representative of the signal density throughtout the SCE service territory around residential or industrial zones of similar customer density.

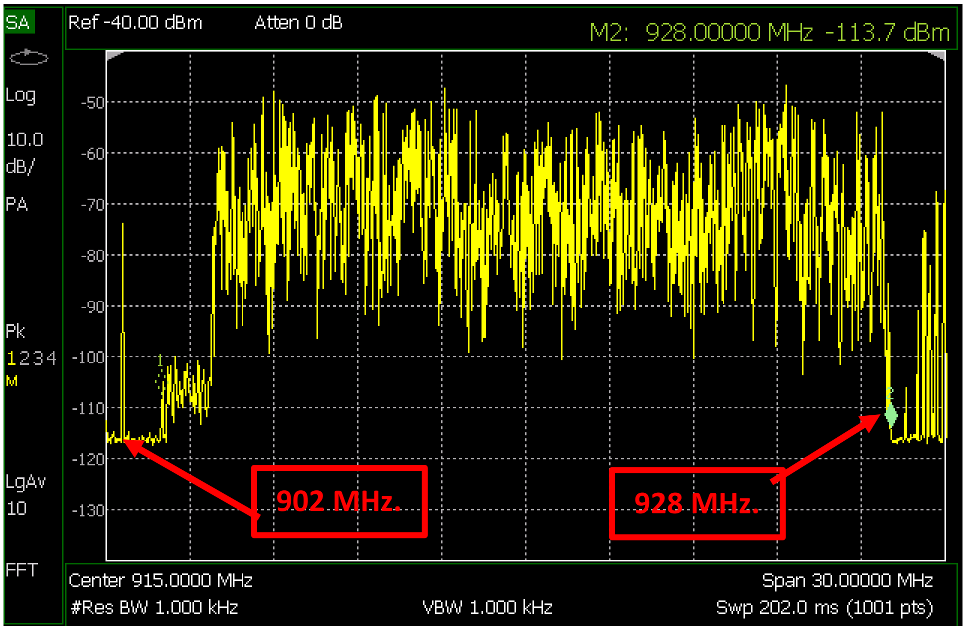

Figure 2: **Typical spectrum usage in the 902-928 MHz. band. Measurement made in a mixed Industrial and Residential area near the Ontario Airport, Ontario, CA**

SCE's Advance Metering Infrastructure (AMI) and Impact:

The proposed reconfiguration of the 900 MHz band by NextNav Inc. has significant implications to SCE and all other Utilities that have Advanced Metering Infrastructure (AMI) communication systems. AMI systems, which rely on the 900 MHz band for reliable and efficient data transmission, could face substantial operational challenges and negative impacts due to the changes proposed by NextNav.

Key Impacts:

1. **Interference and Signal Integrity:**
    - The introduction of high-powered 5G cellular and location services in the 902-928 MHz band could lead to increased interference, affecting the signal integrity of AMI systems.
    - Potential signal bleed-over from the new commercial applications may necessitate frequent re-tuning of AMI communication equipment to maintain performance accuracy.
2. **Operational Costs:**
    - AMI operators may incur additional costs for upgrading or replacing existing equipment to mitigate interference and ensure compliance with the new band configuration.
    - Increased maintenance routines and potential revenue leakage due to missed data transmissions could further elevate operational expenses.
3. **Spectrum Availability:**
    - The reduction in available spectrum for AMI communication, as proposed by NextNav, could limit the capacity and scalability of AMI networks.
    - This reallocation may hinder the deployment of future AMI technologies and services, impacting the overall efficiency and reliability of utility operations.
4. **Regulatory and Compliance Challenges:**
    - AMI operators will need to navigate new regulatory requirements and ensure compliance with updated FCC rules governing the 900 MHz band.
    - The proposed changes may also necessitate coordination with other spectrum users to minimize conflicts and ensure harmonious coexistence.

While NextNav's proposal aims to enhance nationwide terrestrial location services and 5G connectivity, it is crucial to carefully consider the potential adverse effects on AMI communication systems. Ensuring a balanced approach that protects the interests of all stakeholders, including AMI operators, is essential for maintaining the integrity and efficiency of critical infrastructure services.

Automated Meter Reading (AMR) is one of the foundational steps required to deploy Smart Grid Technology. According to SmartGrid.com "the digital technology that allows for [reliable] two-way communication between the utility and its customers, and the sensing along the transmission lines is what makes the grid smart. Like the Internet, the Smart Grid will consist of controls, computers, automation, and new technologies and equipment working together, but in this case, these technologies will work with the electrical grid to respond digitally to our quickly changing electric demand".

The concept of a Smart Grid was first widely introduced within "The American Recovery and Reinvestment Act" ("Recovery Act") signed into law by President Obama on February 17, 2009 (P.L.111-5). The Recovery Act allocated $4.5 billion to the Department of Energy's to develop guidelines for deployment by utilities. SCE is directly regulated by the California Public Utilities Commission (CPUC). As directed by the Recovery Act the CPUC has developed requirements at the State level for SCE and other regulated California utilities to be deploying technologies for Smart Grid.

Not only will the basic functions of AMR be impacted by the 900 MHz ISM Band realignment, but the action will diminish SCE's the ability to fully deploy and operate a Smart Grid in Southern California and achieve the visions of the Recovery Act and CPUC goals.

III. SCE Comments on NextNav Proposals.

SCE offers the following responses to questions in the Public Notice regarding elements of the NextNav proposals.

A. Removal of Non-Interference Requirement.

The Public Notice states: *"With respect to part 15 devices, NextNav states that it is completing technical analyses and 'will work with unlicensed users to understand their spectrum requirements.' NextNav does, however, seek the removal of the current requirement that it not cause unacceptable levels of interference to part 15 devices."*

As an incumbent using of the Lower 900 MHz Band for core operations, SCE strongly opposes the proposal to remove the requirement that NextNav not cause unacceptable levels of interference to Part 15 devices.

There are two important reasons for keeping the requirement in place. First, it is highly likely that NextNav's radio distribution density will very closely match that of SCE. One stated purpose is that NextNav will provide 3D GPS positioning to the E911 network. This would likely indicate that wherever the population density is greatest the NextNav spectrum usage density will likely be highest. This will impact both networks if they are sharing the same spectrum.

The second reason is that if the spectrum is split as NextNav proposes, then the creation of adjacent spectrum interfaces at 907 MHz and 918 MHz will be an additional point for cross band and cross user interference to occur.

If the requirement that NextNav not cause unacceptable levels of interference to Part 15 devices is eliminated, then the problem of creating an RF buffer band falls squarely on incumbent Part 15 users.

B. The Impact of Proposed Band Reconfiguration.

If the FCC amends the rules as the Petitioner has requested, then the remaining users of the Band will be left with less than half of the original allocated spectrum. If there were no other competing signals remaining in the Band except our own, we anticipate that the result of the realignment would cause a significant increase in packet transit time across our network. However, the fact that there are other users in the band will further exacerbate the delaying of packets.

Another concern that arises from band reconfiguration is the shared band edges between Petitioner's spectrum and relocated Part 15 users. *See* Figure 3 below. The band edge at 907 MHz delineates the Petitioner's "uplink" from the realigned Part 15 band. There is no buffer or white space band here, just users having to create their own method of dealing with the potential inter-service interference. SCE urges the FCC not to adopt any rules that require the realigned users of the Lower 900 Band to accept interference from the newly reconfigured licensed band. If incumbents are required to accept this interference and in turn be required not to interfere with the licensed service of the realigned Lower 900 MHz Band, incumbents like SCE will necessarily need to create a buffer band out of the remaining Lower 900 MHz Band spectrum. The same set of problems exist at the 918 MHz interface.

What will remain for incumbents if the Band is reconfigured as proposed? As an incumbent user, SCE will be required to replace most of its existing radios just to comply with new band edge interference rules. These new radios will be manufactured to have both robust physical RF filtering and software filtering to prevent any interference to the new bands. Until the new rules are in place it is unknowable how much buffer band might be required.

An estimate of the remaining usable spectrum would be the core 7-9 MHz of the realigned Lower 900 MHz Band, or roughly 30% of the original band prior to realignment.

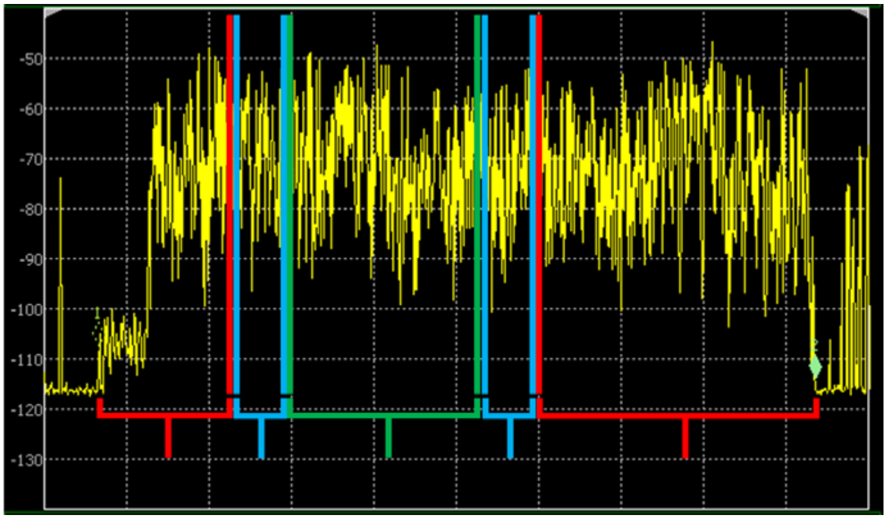

***Figure 3:* Spectrum available for SCE and all other users after band realignment is 907-918 MHz. Actual RF Spectral Emission Requirements may mandate a buffer zone, shown in Blue here. Actual available and usable spectrum could be as little as 909-916 MHz.**

C. Possible Accommodations in Other Spectrum Bands.

The Public Notice seeks comments as to whether other spectrum options are available to fully or partially mitigate the impact if the proposed new service was deployed in the Lower 900 MHz Band. The present answer is no.

In 2018 SCE began to look for a possible replacement of the NetComm Radio System to ultimately take advantage of newer technologies. One such program was to utilize the spectrum allocated under IEEE 802.11a, b and g. Two vendors were selected, and test radio networks were constructed within typical service territory. Neither network technology was shown to be viable due to the ubiquitous existence of other 802.11 users in the bands.

SCE recognizes that there are licensed services at frequencies above 940 MHz, but the density of usage from the location this spectrum capture was made appears very low. *See* Figure 4 below. If the Commission were to reconfigure the 900 MHz Band, SCE wonders if it is possible that some of the licensed services could share the burden in a reconfiguration.

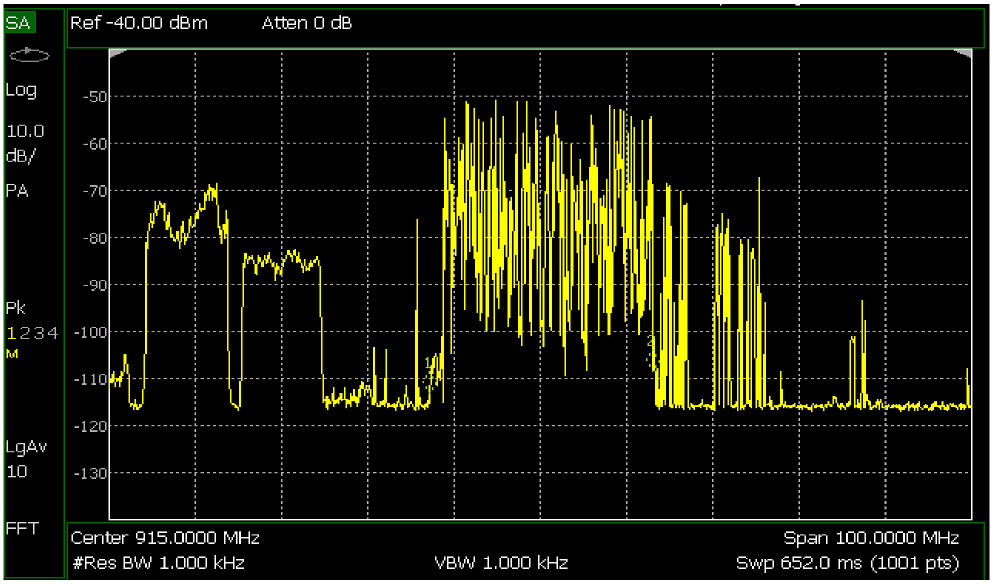

***Figure 4*: Spectrum usage in the 902-928 MHz. band, mixed Industrial and Residential near the Ontario Airport, Ontario, CA (marker 1, 902.0 MHz, marker 2, 928.0 MHz.)**

D. Costs of Spectrum Relocation

The Public Notice seeks comments on the cost and timing for incumbent relocation. Any major changes to or relocation of SCE's systems deployed in the 900 MHz band will result in significant and large-scale impacts, costing several hundred million dollars, that will directly affect millions of households, business customers and rate payers. Any such relocation will require 10-15 years due to the size, volume and complexity of SCE's infrastructure and systems.

IV. Conclusion

SCE urges the Commission to reject any changes in the existing rules that negatively impact present wireless communications operation in the Lower 900 MHz Band, specifically rules that would a) restrict in any manner the present and future use of the full existing allocated spectrum of 902-928 MHz by incumbents, b) elevate the standing of any entity using the Band to have priority of usage, such as immunity from causing interference and protection from receiving interference, over that of SCE and incumbent users, c) modify or create new licensed uses/users in the band operating under nationwide, system or similar licensing where the specific location of each transmitter is not documented and otherwise made available publicly prior to commencement of operation and d) allow such a licensed service to lease or sell excess capacity to other entities where such action was not part of any original FCC Authorization.

Respectfully submitted,

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September 3, 2024